

FORM PTO-1390 (REV 5-93)		U S DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE		ATTORNEY'S DOCKET NUMBER 2296.2300
<b>TRANSMITTAL LETTER TO THE UNITED STATES DESIGNATED/ELECTED OFFICE (DO/EO/US) CONCERNING A FILING UNDER 35 U.S.C. 371</b>				U S APPLICATION NO (If known, see 37 CFR 1.5) <b>09/720205</b>
INTERNATIONAL APPLICATION NO. <b>PCT/GB99/02106</b>		INTERNATIONAL FILING DATE 2 July 1999 (02.07.99)	PRIORITY DATE CLAIMED 2 July 1998 (02.07.98)	
TITLE OF INVENTION <b>BLOOD CHUNKS</b>				
APPLICANT(S) FOR DO/EO/US TRADEMARK OFFICE <b>Tim FISHER and Charles SPEIRS</b>				
<p>Applicant herewith submits to the United States Designated/Elected Office (DO/EO/US) the following items and other information:</p> <ol style="list-style-type: none"> <li><input checked="" type="checkbox"/> This is a <b>FIRST</b> submission of items concerning a filing under 35 U.S.C. 371.</li> <li><input type="checkbox"/> This is a <b>SECOND</b> or <b>SUBSEQUENT</b> submission of items concerning a filing under 35 U.S.C. 371.</li> <li><input type="checkbox"/> This express request to begin national examination procedures (35 U.S.C. 371(f)) at any time rather than delay examination until the expiration of the application time limit set in 35 U.S.C. 371(b) and PCT Articles 22 and 39(l).</li> <li><input checked="" type="checkbox"/> A proper Demand for International Preliminary Examination was made by the 19th month from the earliest claimed priority date.</li> <li><input checked="" type="checkbox"/> A copy of the International Application as filed (35 U.S.C. 371(c)(2))             <ol style="list-style-type: none"> <li><input checked="" type="checkbox"/> is transmitted herewith (required only if not transmitted by the International Bureau).</li> <li><input type="checkbox"/> has been transmitted by the International Bureau.</li> <li><input type="checkbox"/> is not required, as the application was filed in the United States Receiving Office (RO/US).</li> </ol> </li> <li><input type="checkbox"/> A translation of the International Application into English (35 U.S.C. 371(c)(2)).</li> <li><input type="checkbox"/> Amendments to the claims of the International Application under PCT Article 19 (35 U.S.C. 371(c)(3))             <ol style="list-style-type: none"> <li><input type="checkbox"/> are transmitted herewith (required only if not transmitted by the International Bureau).</li> <li><input type="checkbox"/> have been transmitted by the International Bureau.</li> <li><input type="checkbox"/> have not been made; however, the time limit for making such amendments has NOT expired.</li> <li><input type="checkbox"/> have not been made and will not be made.</li> </ol> </li> <li><input type="checkbox"/> A translation of the amendments to the claims under PCT Article 19 (35 U.S.C. 371(c)(3)).</li> <li><input checked="" type="checkbox"/> An oath or declaration of the inventor(s) (35 U.S.C. 371(c)(4)).</li> <li><input type="checkbox"/> A translation of the annexes to the International Preliminary Examination Report under PCT Article 36 (35 U.S.C. 371(c)(5)).</li> </ol>				
<p><b>Items 11. to 16. below concern other document(s) or information included:</b></p> <ol style="list-style-type: none"> <li><input type="checkbox"/> An Information Disclosure Statement under 37 CFR 1.97 and 1.98.</li> <li><input type="checkbox"/> An assignment document for recording. A separate cover sheet in compliance with 37 CFR 3.28 and 3.31 is included.</li> <li><input checked="" type="checkbox"/> A <b>FIRST</b> preliminary amendment.             <ol style="list-style-type: none"> <li><input type="checkbox"/> A <b>SECOND</b> or <b>SUBSEQUENT</b> preliminary amendment.</li> </ol> </li> <li><input type="checkbox"/> A substitute specification.</li> <li><input type="checkbox"/> A change of power of attorney and/or address letter.</li> <li><input checked="" type="checkbox"/> Other items or information: International Search Report and International Preliminary Examination Report</li> </ol>				

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17.  The following fees are submitted:

**Basic National Fee (37 CFR 1.492(a)(1)-(5):**

Search Report has been prepared by the EP or JPO .....	\$860.00
International preliminary examination fee paid to USPTO (37 CFR 1.492(a)(1)) .....	\$690.00
No international preliminary examination fee paid to USPTO (37 CFR 1.492 (a)(1)) but international search fee paid to USPTO (37 CFR 1.492(a)(2)) .....	\$710.00
Neither international preliminary examination fee (37 CFR 1.492(a)(1)) nor international search fee (37 CFR 1.492(a)(2)) paid to USPTO .....	\$1,000.00
International preliminary examination fee paid to USPTO (37 CFR 1.492 (a)(4)) and all claims satisfied provisions of PCT Article 33(1)-(4) .....	\$100.00

**ENTER APPROPRIATE BASIC FEE AMOUNT =**

\$1,000.00

Surcharge of \$130.00 for furnishing the oath or declaration later than  20  30 months from the earliest claimed priority date (37 CFR 1.492(e)).

\$

Claims	Number Filed	Number Extra	Rate	
Total Claims	15	-20 =	X \$18.00	\$
Independent Claims	2	- 3 =	X \$80.00	\$
Multiple dependent claim(s) (if applicable)			+ \$270.00	\$ 270.00

**TOTAL OF ABOVE CALCULATIONS =**

\$

Reduction by 1/2 for filing by small entity, if applicable. Verified Small Entity statement must also be filed. (Note 37 CFR 1.9, 1.27, 1.28).

\$

**SUBTOTAL =**

\$

Processing fee of \$130.00 for furnishing the English translation later than  20  30 months from the earliest claimed priority date (37 CFR 1.492(f)).

\$

**TOTAL NATIONAL FEE =**

\$

Fee for recording the enclosed assignment (37 CFR 1.21(h)). The assignment must be accompanied by an appropriate cover sheet (37 CFR 3.28, 3.31). \$40.00 per property +

\$

**TOTAL FEES ENCLOSED =**

\$ 1,270.00

Amount to be:

refunded \$

charged \$

- a.  A check in the amount of \$ 1,270.00 to cover the above fees is enclosed.
- b.  Please charge my Deposit Account No. \_\_\_\_\_ in the amount of \$ \_\_\_\_\_ to cover the above fees. A duplicate copy of this sheet is enclosed.
- c.  The Commissioner is hereby authorized to charge any additional fees which may be required, or credit any overpayment to Deposit Account No. 06-1205. A duplicate copy of this sheet is enclosed.

**NOTE: Where an appropriate time limit under 37 CFR 1.494 or 1.495 has not been met, a petition to revive (37 CFR 1.137(a) or (b)) must be filed and granted to restore the application to pending status.**

SEND ALL CORRESPONDENCE TO:

Fitzpatrick, Cella, Harper & Scinto  
30 Rockefeller Plaza  
New York, NY 10011-3801



SIGNATURE

Raymond R. Mandra

NAME

Registration No.: 34,382

09/720205  
JCC1 Rec'd PCT/PTO 22 DEC 2000

2296.2300

PATENT APPLICATION

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE  
AS THE DESIGNATED/ELECTED OFFICE (DO/EO/US)

In re Application of: )  
Tim FISCHER et al ) : Examiner: N/Y/A  
Application No.: 35 USC 371 of ) : Group Art Unit: N/Y/A  
PCT/GB99/02106 )  
Filed: July 2, 1999 )  
For: BLOOD CHUNKS ) : December 21, 2000

Commissioner for Patents  
Washington, D.C. 20231

PRELIMINARY AMENDMENT

Sir:

Prior to examination on the merits, please amend  
the above-identified application as follows:

IN THE CLAIMS:

Please cancel claims 10-11.

Kindly amend claims 1-8 as follows:

Claim 1, line 2, delete "(as herein defined)".

Claim 2, line 2, delete "(as herein defined)".

Claim 3, line 1, "claim" should read -- claims --.

Claims 4-8, line 1, "any preceding claims" should  
read -- claims 1 or 2 --.

REMARKS

The claims are 1-9. Claims 10-11 have been cancelled. Claims 1-8 have been amended to better define the invention and provide for proper multiple dependency. No new matter has been added. Accordingly, favorable consideration of the present claims is respectfully requested.

Applicants' undersigned attorney may be reached in our New York office at (212) 218-2100. All correspondence should continue to be directed to our below-listed address.

Respectfully submitted,

  
Raymond R. Mandra  
Attorney for Applicants  
Registration No. 34,382

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3/PRTS  
PCT/GB99/02106

09/720205

JCC1 Rec'd PCT/PTO 22 DEC 2000

BLOOD CHUNKS

The present invention relates to the preparation of a novel edible chunk comprising blood, and to the chunk itself.

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Blood and blood fractions are used in the manufacture of pet foods as a nutrient. In particular, the haemoglobin fraction of whole blood is employed; by the haemoglobin fraction is meant the residue from whole blood once the plasma, or most of the plasma, has been removed. The haemoglobin fraction consists of red and white blood cells with a residue of plasma. The haemoglobin fraction typically contains from about 14% to 40% protein and about 35% to 45% red blood cells. The remainder is mainly water together with other blood components.

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Conventionally, whole blood is heated by scraped surface heating or steam infusion to 75°C and treated with hydrogen peroxide to decolour it. The decoloured blood is dewatered to give a powder. In alternative techniques, whole blood is coagulated with for example a solution containing calcium ions and the resulting coagulate cut into chunks. Such chunks are homogeneous in texture, resembling liver.

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It has now been found that if a blood fraction, defined herein as comprising from about 14% to about 40% protein and about 35% to 45% red blood cells, is heated and treated with hydrogen peroxide a solid foam results. The foam reaction product can be cut into chunks and incorporated into, for example, pet food. If the foam reaction product is compressed, a textured solid mass is produced. The compressed solid mass has a laminar structure similar to that of cooked meat.

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The blood fraction may be formed in any way. The blood fraction may be the haemoglobin fraction of blood. Alternatively, the blood fraction may be formed by removing water from whole blood to concentrate it so that it comprises from about 14% to about 40% protein and about 35% to 45% red blood cells. The blood fraction may be reconstituted from purified protein and red blood cells.

According to the invention there is provided a method of forming a blood chunk comprising heating a blood fraction (as defined above), treating the heated blood fraction with hydrogen peroxide and compressing the resulting reaction product to form a chunk having a laminar structure.

Preferably the blood fraction is a haemoglobin fraction (as defined above).

Preferably the hydrogen peroxide is added to the blood fraction at at least 0.5% by weight. There does not appear to be a significant upper limit to the concentration of hydrogen peroxide in the reaction mixture which is effective to cause the desired reaction to take place; concentrations of up to 3% (by weight) have been found satisfactory.

Preferably, compression is carried out at a temperature greater than 60°C.

Preferably the blood fraction is heated to between 60°C and 80°C before addition of the hydrogen peroxide.

Preferably the blood fraction comprises at least about 10%, more preferably at least about 15%, by weight protein. At lower protein concentrations, the reaction product does not absorb all the water present in the reaction mixture. Such products are useful and their manufacture falls within the scope of the present invention; however, it will usually be

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necessary to remove the proteinaceous material from the unabsorbed water before it is used.

5 Additives may be included in the blood fraction to modify the nutritional content and flavour of the chunks. It is preferred that the pH of the blood fraction is no less than 4, and that it is no greater than 9.

10 Compression of the reaction product of the blood fraction and hydrogen peroxide can be carried out on the reaction product as it is formed, or the reaction product can be stored and then subjected to heating, for example by microwave radiation, prior to compressing. Alternatively, the reaction product may be steamed to give a product having 15 a jelly-like texture. The steaming can be carried out with meat juices or other flavoured aqueous media to impart particular flavours to the product.

The product can be dried, preferably at about 60°C, to produce hard, crunchy chunks, which are useful as a dry pet food.

20 The reaction product of the blood fraction and hydrogen peroxide can be compressed under its own weight.

The reaction product may be compressed as a result of restriction of any expansion of the reaction product caused by evolution of gas as the blood fraction and hydrogen 25 peroxide react.

The pressure at which the reaction product of the blood fraction and hydrogen peroxide is compressed to achieve the laminar internal structure is not critical; a pressure of up to about 400 kPa is preferred.

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Also according to the invention there is provided an edible chunk comprising a major amount of blood protein and having a fibrous, laminar internal structure.

5 The invention will be further described, by way of example, with reference to the drawings in which;

Figure 1 shows schematically a method according to a first embodiment of the invention;

10 Figure 2 shows schematically a method according to a second embodiment of the invention; and

Figure 3 shows schematically a method according to a third embodiment of the invention.

The methods according to the invention shown in the drawings include the following common features. The haemoglobin fraction of blood is pumped from a tank 10 by a peristaltic pump 12 to a steam infuser 14 where the haemoglobin is heated to about 75°C. The heated haemoglobin passes from the steam infuser 14 to a high shear mixer reactor 16, such as a Dispax reactor. In the Dispax reactor, the haemoglobin is reacted with hydrogen peroxide pumped from a hydrogen peroxide tank 18 by a hydrogen peroxide pump 20. In the reactor 16, the haemoglobin and the hydrogen peroxide are mixed efficiently. Preferably, the reactor is a high shear, low volume mixer to ensure adequate mixing of the two components.

In the first embodiment of the invention, shown in Figure 1, the foam reaction product 22 is deposited in a tray 24. The reaction product 22 can be allowed to be compressed by its own weight, in which case the solid mass produced is elastic and can be cut up to provide elastic chunks. Alternatively, pressure can be applied to the reaction product 22 in the

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tray by application of a pressure plate 26. On release of the pressure plate a solid product 28 having a fibrous, laminar internal structure is produced, which can then be cut into chunks 30 as at 32.

5 In the second embodiment of the invention, shown in Figure 2, the reaction product 22 from the reactor 16 is passed to a piston pump 40 in which the reaction product is compressed. As the reaction product 22 leaves the piston pump 40, it is diced as at 42 to produce chunks 44 having a  
10 fibrous, laminar internal structure.

In the third embodiment of the invention, shown in Figure 3, the reaction product 22 leaves the reactor 16 through a disperser 50, from where it passes into a mouth formed by the widely separated ends of two converging continuous belts  
15 52, 44. The reaction product is compressed between the two continuous belts, and the resulting solid sheet 56 is cut into chunks 58 as it leaves the continuous belts 52, 54, as at 60. Again, the chunks produced have a fibrous, laminar internal structure.

20 The chunks have a fibrous, laminar internal structure, similar to that of meat chunks, so that the chunks can be readily used in canned food stuffs such as pet foods to provide a protein source which is analogous in appearance and texture to meat.

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CLAIMS

- 5        1. A method of manufacturing a blood chunk comprising: heating a blood fraction (as herein defined); adding hydrogen peroxide; and compressing the resulting reaction product to form a chunk having a laminar structure.
- 10      2. A method according to claim 1 in which the blood fraction is a haemoglobin fraction (as herein defined).
- 15      3. A method according to claim 1 or 2 in which the compression is carried out at a temperature greater than 60°C.
- 20      4. A method according to any preceding claim in which the compressed product is dried.
- 25      5. A method according to any preceding claim further comprising steaming the reaction product of the blood fraction and the hydrogen peroxide.
- 6. A method according to any preceding claim in which the hydrogen peroxide is added to the blood fraction at at least 0.5% (by weight).
- 7. A method according to any preceding claim in which the blood fraction is heated to between 60°C and 80°C before addition of the hydrogen peroxide.
- 8. A method according to any preceding claim in which the blood fraction comprises at least 10%, preferably at least 15%, protein by weight.
- 9. An edible chunk comprising a major proportion of blood protein and having a fibrous, laminar internal structure.

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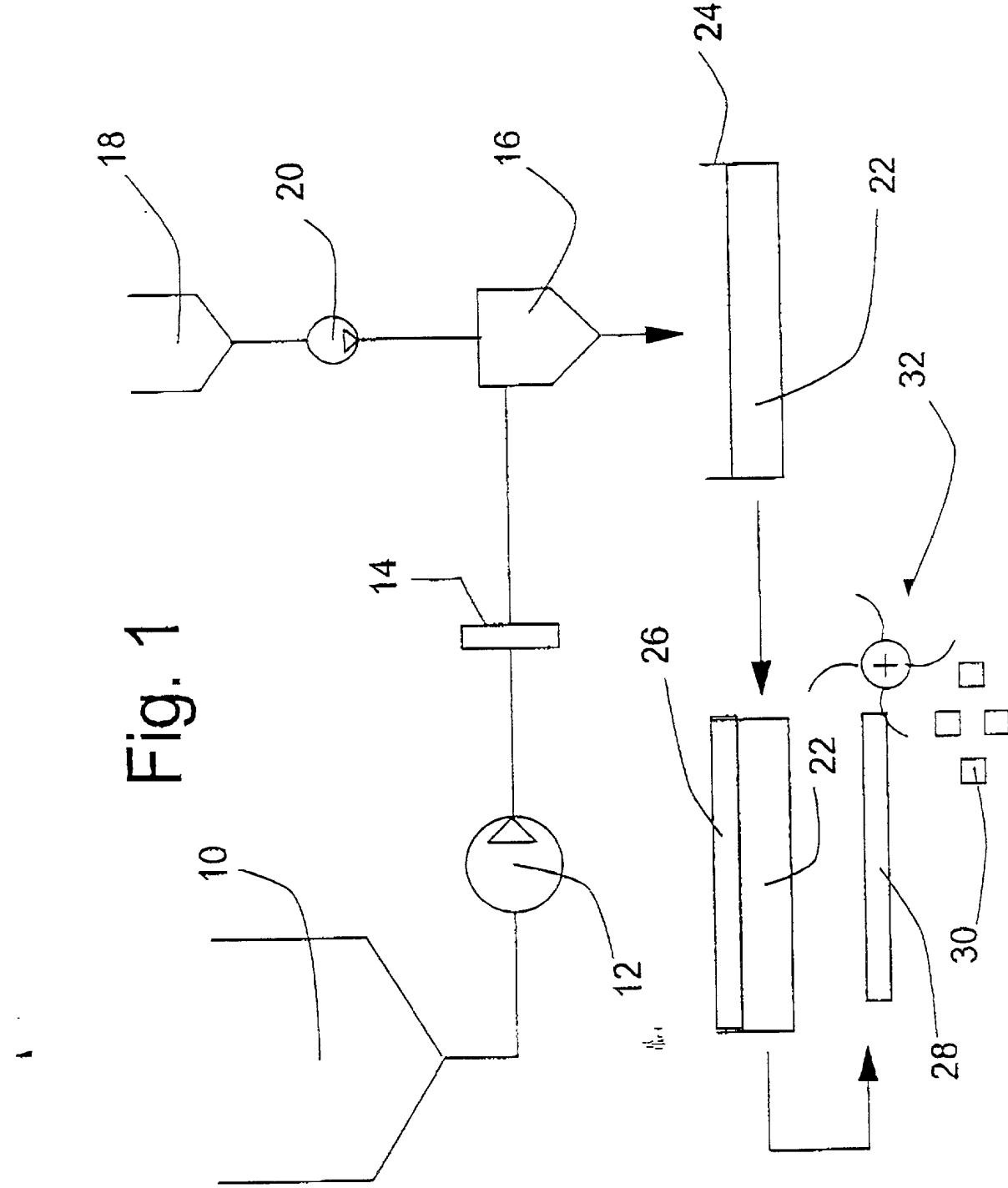
- 7 -

10. A method substantially as described.
11. A chunk substantially as described.

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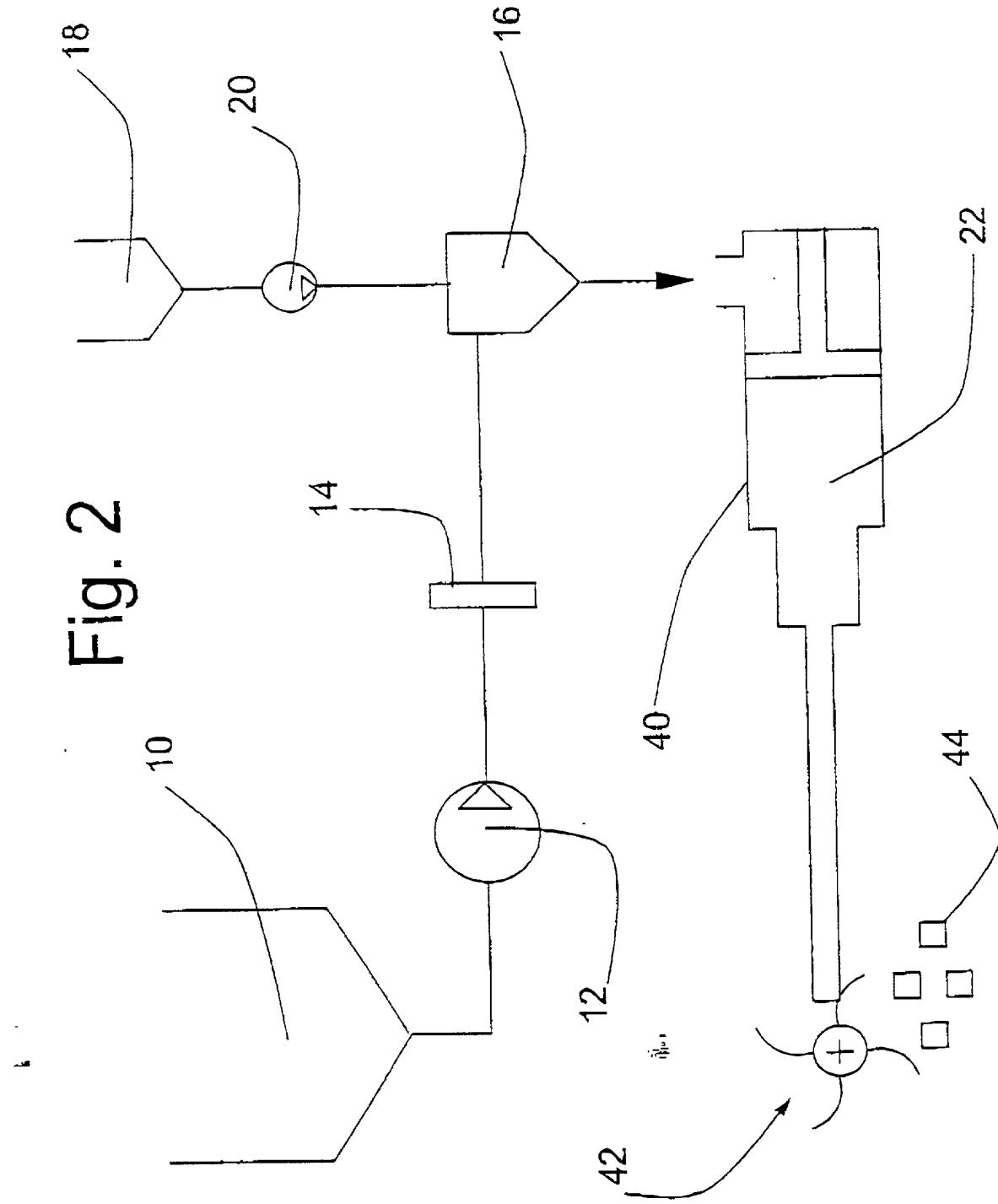
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**Fig. 1**

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**Fig. 2**

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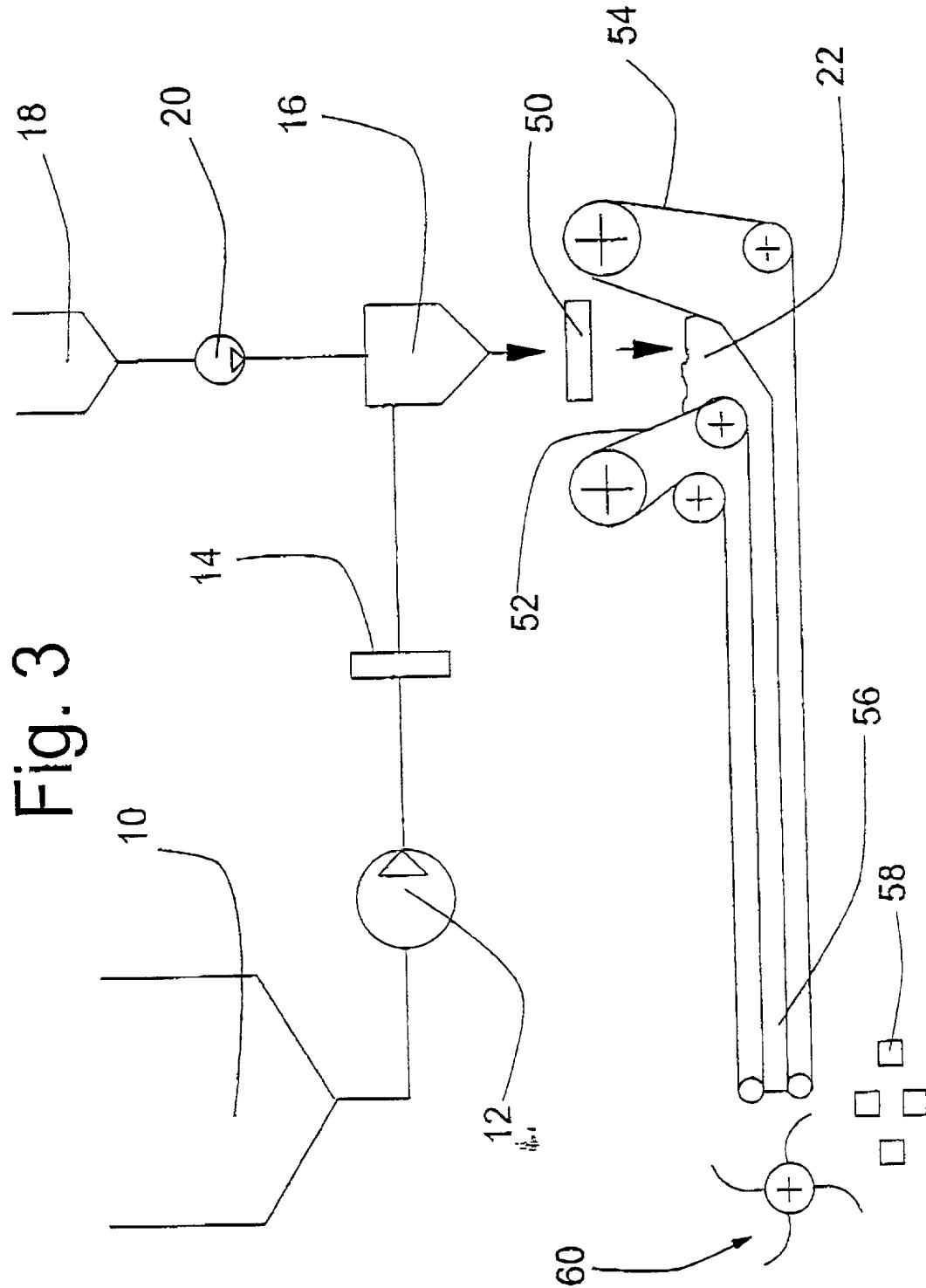


Fig. 3



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COMBINED DECLARATION AND POWER OF ATTORNEY  
FOR PATENT COOPERATION TREATY APPLICATION

As a below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name.

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled BLOOD CHUNKS

the specification of which was filed as PCT International Application No. PCT/GB99/02106 on 2 July 1999 and was amended under PCT Article 19 on \_\_\_\_\_ (if applicable).

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose information which is material to patentability as defined in 37 CFR §1.56.

I hereby claim foreign priority benefits under Title 35, United States Code, § 119 of any foreign application(s) for patent or inventor's certificate or of any PCT international application(s) designating at least one country other than the United States of America listed below and have also identified below any foreign application(s) for patent or inventor's certificate or any PCT international application(s) designating at least one country other than the United States of America filed by me on the same subject matter having a filing date before that of the application(s) on which priority is claimed:

Country	Application No.	Filed (Day/Mo./Yr.)	Priority Claimed (Yes/No)
U.K.	9814395.1	2 July 1998	YES
U.K.	9814396.9	2 July 1998	YES

I hereby appoint the practitioners associated with the firm and Customer Number provided below to prosecute this application and to transact all business in the Patent and Trademark Office connected therewith, and direct that all correspondence be addressed to the address associated with that Customer Number:

FITZPATRICK, CELLA, HARPER &amp; SCINTO

(Customer Number: 05514)

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

1-00 Full Name of Sole or First Inventor Tim BISHER  
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 Inventor's signature C. Speirs  
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 Form #37

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